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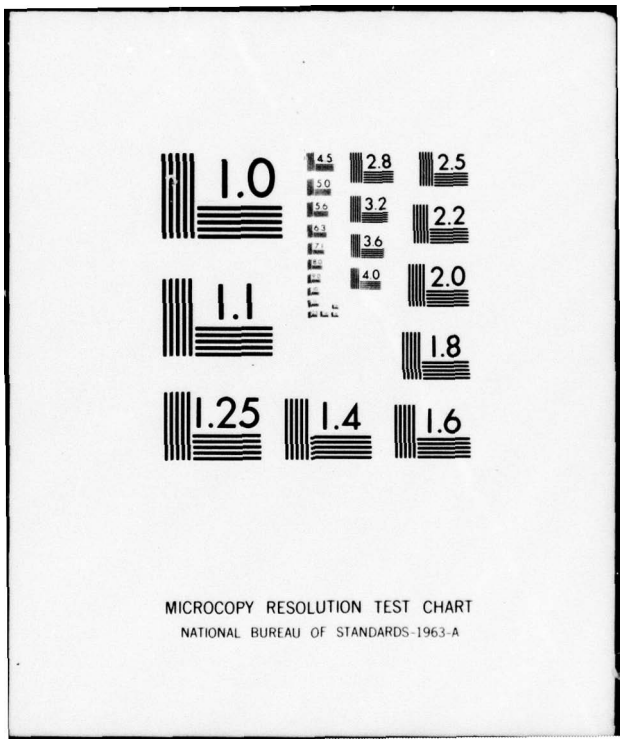
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NATIONAL BUREAU OF STANDARDS-1963-A

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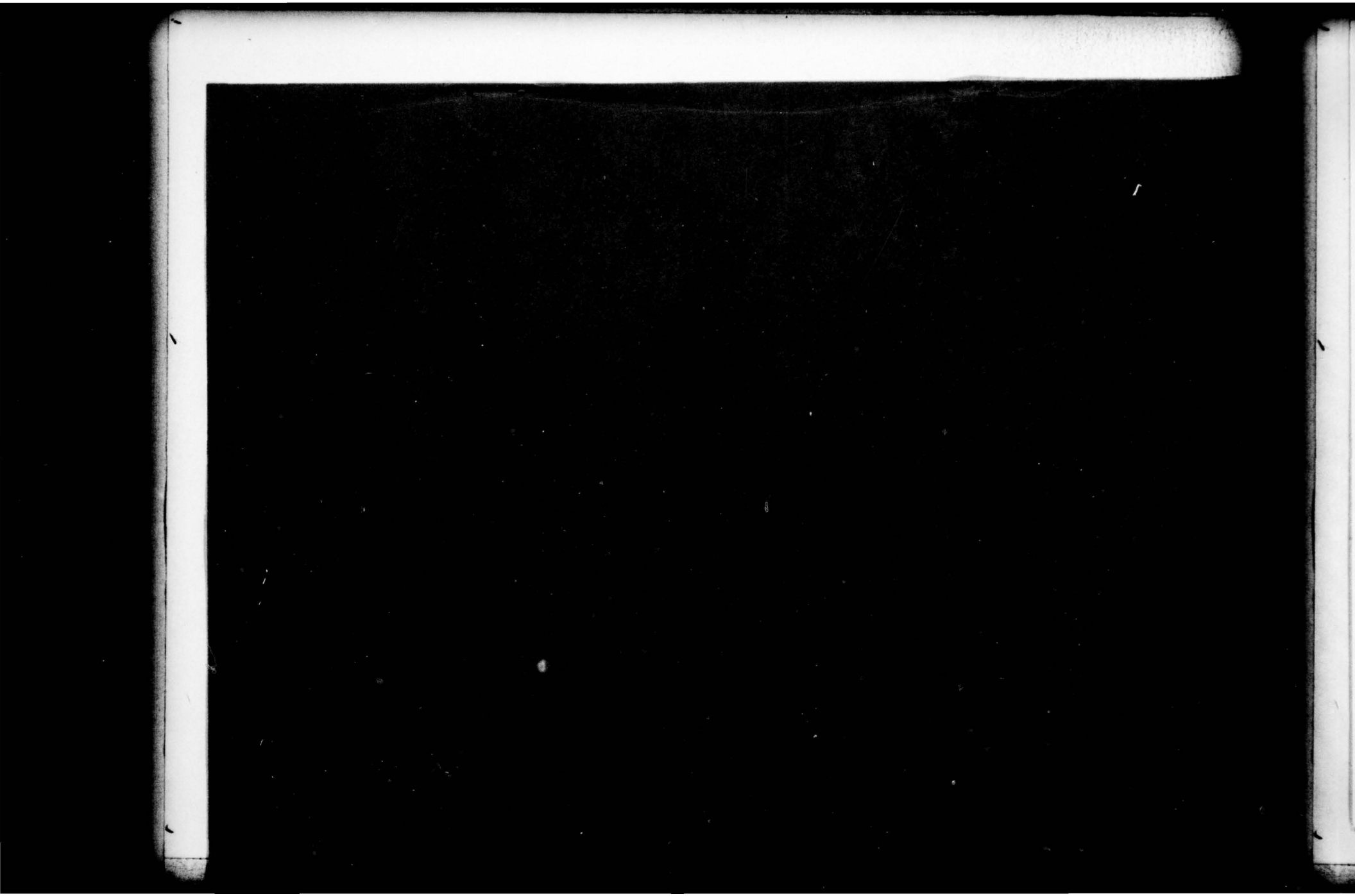

ESD-TR-77-29

ERRATA SHEET

SPECULAR REFLECTION TIMING PREDICTIONS
FOR THE PERIOD
PRECEDING THE 1977 VERNAL EQUINOX

PROJECT REPORT ETS-8

Table I, page 2:

Since the figure numbers were inadvertently omitted from the computer printouts, column three has been changed to page numbers, NOT figure numbers.

Please insert this errata sheet in all copies of the above-designated report.

Publications Office
M.I.T. Lincoln Laboratory
P.O. Box 73
Lexington, Massachusetts 02173

11 February 1977

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
LINCOLN LABORATORY

SPECULAR REFLECTION TIMING PREDICTIONS FOR THE PERIOD PRECEDING THE 1977 VERNAL EQUINOX

A. S. FRIEDMAN
Group 94

PROJECT REPORT ETS-8

26 JANUARY 1977

LEXINGTON MASSACHUSETTS

ABSTRACT

With the approach of the vernal equinox, preparations for observing specular reflections from cylindrical synchronous satellites have begun. The purpose of this report is to assemble the results of preliminary computations to make them available for observation scheduling at the GEODSS Experimental Test Site.

With the approach of the vernal equinox, preparations for observing specular reflections from cylindrical synchronous satellites have begun. The purpose of this report is to assemble the results of preliminary computations to make them available for observation scheduling at the GEODSS Experimental Test Site. The reader should consult ETS-3* for details of the mathematics of specular timing.

The orbital elements and axial orientations on which the specular occurrence calculations are based are the best available on 20 January 1977. For data reduction and analysis, current values will be employed. A further assumption is that the symmetry axis of each satellite coincides with its spin axis. Analysis of the departure of observation times from the predicted values will provide information on axial misalignment.

The IDCSP satellites and LES-5 drift in and out of coverage. As no information on their axial position is available, by convention it is placed perpendicular to the orbital plane. For all other satellites, axial orientation is specified.

In 1977 the vernal equinox occurs on 20 March at 17^h43^m UT. As expected, February and March are the prime months for specular observing. Table 1 is an index of the satellites and their time tables.

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*A. S. Friedman, "Determination of Specular Reflection From Cylindrical Satellites for Electro-Optical Surveillance and SOI," Project Report ETS-3, Lincoln Laboratory, M.I.T. (8 October 1976).

TABLE 1

INDEX TO SPECULAR TIMING CHARTS

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
03509. USA SITE= STAL
DESTTA 74 022 A WESTAR - I (SOC 7250)

EPOCH= 1977 6 10:16: 5.9
N= 1.00268417 A= 6.6109 E= 0.0001994 I= 0.0130
ANODE= 310.6090 ARGPER= 262.2318 M= 307.9709

RHO*A= 0.48 RAAX= 220.74 DECAX= 89.91 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.08 LONG FROM ANODE= 270.15

SATELLITE GRAPHIC TIME TABLE
FROM MAR 1977 THROUGH MAR 1977

LOCAL MEAN SOLAR TIME

	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
1977																		*1977*
1 MAR 60			!S	! T	!	!	!	! EEEEI	!	!	!	!	!	!T	! S	!		2 MAR 61
2 MAR 61			!S	! T	!	!	!	! EEEEI	!	!	!	!	!	T!	! S	!		3 MAR 62
3 MAR 62			!S	! T	!	!	!	! EEEEIE	!	!	!	!	!	T!	! S	!		4 MAR 63
4 MAR 63			!S	! T	!	!	!	! EEEEIE	!	!	!	!	!	T!	! S	!		5 MAR 64
5 MAR 64			!S	! T	!	!	!	! EEEEIE	!	!	!	!	!	T!	*****!*S	!		6 MAR 65
6 MAR 65			!S*****	!*****	!*****	!*****	!*****	!*EEEEEIE*****	!	!*****	!*****	!*****	!*****	!*****	!*S	!		7 MAR 66
7 MAR 66			!S	! T	!	!	!	! EEEEEIE	!	!	!	!	!	T!	! S	!		8 MAR 67
8 MAR 67			!S	! T	!	!	!	! EEEEEIE	!	!	!	!	!	T!	! S	!		9 MAR 68
9 MAR 68			!S	! T	!	!	!	! EEEEEIE	!	!	!	!	!	T!	! S	!		10 MAR 69
10 MAR 69			!S	! T	!	!	!	! EEEEEIE	!	!	!	!	!	T !	! S	!		11 MAR 70
11 MAR 70			!S	! T	!	!	!	! EEEEEIE	!	!	!	!	!	T !	! S	!		12 MAR 71
12 MAR 71			! S	! T	!	!	!	! EEEEEIE	!	!	!	!	!	T !	!S	!		13 MAR 72
13 MAR 72			! S	! T	!	!	!	! EEEEEIE	!	!	!	!	!	T !	!S	!		14 MAR 73
14 MAR 73			! S	! T	!	!	!	! EEEEEIE	!	!	!	!	!	T !	!S	!		15 MAR 74
15 MAR 74			! S	! T	!	!	!	! EEEEEIE	!	!	!	!	!	T !	!S	!		16 MAR 75
16 MAR 75			! S	! T	!	!	!	! EEEEEIE	!	!	!	!	!	T !	!S	!		17 MAR 76
17 MAR 76			! S	! T	!	!	!	! EEEEEIE	!	!	!	!	!	T !	!S	!		18 MAR 77
18 MAR 77			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	!	T !	!S	!		19 MAR 78
19 MAR 78			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	!	T !	!S	!		20 MAR 79
20 MAR 79			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	!	T !	S!	!		21 MAR 80
21 MAR 80			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	!	T !	S!	!		22 MAR 81
22 MAR 81			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	!	T !	S!	!		23 MAR 82
23 MAR 82			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	!	T !	S!	!		24 MAR 83
24 MAR 83			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	!	T !	S!	!		25 MAR 84
25 MAR 84			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	T	!	S!	!		26 MAR 85
26 MAR 85			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	T	!	S!	!		27 MAR 86
27 MAR 86			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	T	!	S !	!		28 MAR 87
28 MAR 87			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	T	!	S !	!		29 MAR 88
29 MAR 88			! S	! T	!	!	!	!EEEEEEIE	!	!	!	!	T	!	S !	!		30 MAR 89
30 MAR 89			! S	! T	!	!	!	! EEEEEIE	!	!	!	!	T	!	S !	!		31 MAR 90
31 MAR 90			! S	! T	!	!	!	! EEEEEIE	!	!	!	!	T	!	S !	!		1 APR 91
	! 0	! 1	! 2	! 3	! 4	! 5	! 6	! 7	! 8	! 9	! 10	! 11	! 12	! 13	! 14	! 15	!	

UNIVERSAL TIME

S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
a3569. USA SITE= STAL
DESTIN 74 075 A WESTAR-II PAYLOAD (SUC 7466)

EPOCH= 1976 350 18:38:55.7
N= 1.00274089 A= 6.6106 E= 0.0002922 I= 0.0486
ANODE= 240.9216 ARGPER= 309.7424 M= 50.2318

RHO*A= 0.48 RAAX= 253.56 DECAX= 89.96 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.07 LONG FROM ANODE= 58.71

SATELLITE GRAPHIC TIME TABLE
FROM MAR 1977 THROUGH MAR 1977

LOCAL MEAN SOLAR TIME

1977	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	*1977*
1 MAR 60			S	T					I	EEE				T	S		2 MAR 61	
2 MAR 61			S	T					I	EEEEE				T	S		3 MAR 62	
3 MAR 62			S	T					I	EEEEE				T	S		4 MAR 63	
4 MAR 63			S	T					I	EEEEE				T	S		5 MAR 64	
5 MAR 64			S	T	*				I	EEEEE**					*S		6 MAR 65	
6 MAR 65			S*****	******	******	******	******	******	I*****	EEEEE**	******	******	******	******	*S		7 MAR 66	
7 MAR 66			S	T					I	EEEEEE				T	S		8 MAR 67	
8 MAR 67			S	T					I	EEEEEE				T	S		9 MAR 68	
9 MAR 68			S	T					I	EEEEEE				T	S		10 MAR 69	
10 MAR 69			S	T					I	EEEEEE				T	S		11 MAR 70	
11 MAR 70			S	T					I	EEEEEE				T	S		12 MAR 71	
12 MAR 71		S		T					I	EEEEEE				T	S		13 MAR 72	
13 MAR 72		S		T					I	EEEEEE				T	S		14 MAR 73	
14 MAR 73		S		T					I	EEEEEE				T	S		15 MAR 74	
15 MAR 74		S		T					I	EEEEEE				T	S		16 MAR 75	
16 MAR 75		S		T					I	EEEEEE				T	S		17 MAR 76	
17 MAR 76		S		T					I	EEEEEE				T	S		18 MAR 77	
18 MAR 77		S		T					I	EEEEEEE				T	S		19 MAR 78	
19 MAR 78		S		T					I	EEEEEEE				T	S		20 MAR 79	
20 MAR 79		S		T					I	EEEEEEE				T	S		21 MAR 80	
21 MAR 80		S		T					I	EEEEEEE				T	S		22 MAR 81	
22 MAR 81		S		T					I	EEEEEEE				T	S		23 MAR 82	
23 MAR 82		S		T					I	EEEEEEE				T	S		24 MAR 83	
24 MAR 83		S		T					I	EEEEEEE				T	S		25 MAR 84	
25 MAR 84		S		T					I	EEEEEEE				T	S		26 MAR 85	
26 MAR 85		S		T					I	EEEEEEE				T	S		27 MAR 86	
27 MAR 86		S		T					I	EEEEEEE				T	S		28 MAR 87	
28 MAR 87		S		T					I	EEEEEEE				T	S		29 MAR 88	
29 MAR 88		S		T					I	EEEEEEE				T	S		30 MAR 89	
30 MAR 89		S		T					I	EEEEEEE				T	S		31 MAR 90	
31 MAR 90		S		T					I	EEEEEE				T	S		1 APR 91	

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

UNIVERSAL TIME

S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
83592. USA SITE= STAL
DESTTA 76 042 A COMSTAR I PAYLOAD (ATT/COMSAT)

EPOCH= 1977 6 9:37:42.5
N= 1.00268044 A= 6.6109 E= 0.0004773 I= 0.0074
ANODE= 248.6777 ARGPER= 16.2747 M= 217.2144

RHO*A= 0.47 RAAX= 225.10 DECAX= 89.84 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.16 LONG FROM ANODE= 338.89

SATELLITE GRAPHIC TIME TABLE
FROM MAR 1977 THROUGH MAR 1977

LOCAL MEAN SOLAR TIME

	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
1977																		*1977*
1 MAR	60		S	T					I	EEEE				T	S		2	MAR 61
2 MAR	61		S	T					I	EEEE				T	S		3	MAR 62
3 MAR	62		S	T					I	EEEE				T	S		4	MAR 63
4 MAR	63		S	T					I	EEEEE				T	S		5	MAR 64
5 MAR	64		S	T					I	EEEEEE				T	S		6	MAR 65
6 MAR	65		S	*	*	*	*	*	I	*EEEEEE	*	*	*	*	*S		7	MAR 66
7 MAR	66		S	T					I	EEEEEE				T	S		8	MAR 67
8 MAR	67		S	T					I	EEEEEE				T	S		9	MAR 68
9 MAR	68		S	T					I	EEEEEE				T	S		10	MAR 69
10 MAR	69		S	T					I	EEEEEE				T	S		11	MAR 70
11 MAR	70		S	T					I	EEEEEE				T	S		12	MAR 71
12 MAR	71	S	T						I	EEEEEEE				T	S		13	MAR 72
13 MAR	72	S	T						I	EEEEEEE				T	S		14	MAR 73
14 MAR	73	S	T						I	EEEEEEE				T	S		15	MAR 74
15 MAR	74	S	T						I	EEEEEEE				T	S		16	MAR 75
16 MAR	75	S	T						I	EEEEEEE				T	S		17	MAR 76
17 MAR	76	S	T						I	EEEEEEE				T	S		18	MAR 77
18 MAR	77	S	T						I	EEEEEEE				T	S		19	MAR 78
19 MAR	78	S	T						I	EEEEEEE				T	S		20	MAR 79
20 MAR	79	S	T						I	EEEEEEE				T	S		21	MAR 80
21 MAR	80	S	T						I	EEEEEEE				T	S		22	MAR 81
22 MAR	81	S	T						I	EEEEEEE				T	S		23	MAR 82
23 MAR	82	S	T						I	EEEEEEE				T	S		24	MAR 83
24 MAR	83	S	T						I	EEEEEEE				T	S		25	MAR 84
25 MAR	84	S	T						I	EEEEEEE				T	S		26	MAR 85
26 MAR	85	S	T						I	EEEEEEE				T	S		27	MAR 86
27 MAR	86	S	T						I	EEEEEEE				T	S		28	MAR 87
28 MAR	87	S	T						I	EEEEEEE				T	S		29	MAR 88
29 MAR	88	S	T						I	EEEEEE				T	S		30	MAR 89
30 MAR	89	S	T						I	EEEEEE				T	S		31	MAR 90
31 MAR	90	S	T						I	EEEEEE				T	S		1	APR 91

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

UNIVERSAL TIME

S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
33598, USA SITE= STAL
DESTIN 76 073 A COMSTAR II PAYLOAD (ATT/COMSAT)

EPOCH= 1977 6 3:51:42.7
N= 1.00269535 A= 6.6108 E= 0.0005777 I= 0.0343
ANODE= 64.9458 ARGPER= 277.1700 M= 86.3203

RHO*A= 0.47 HAAX= 225.10 DECAx= 89.84 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.17 LONG FROM ANODE= 149.55

SATELLITE GRAPHIC TIME TABLE
FROM MAR 1977 THROUGH MAR 1977

LOCAL MEAN SOLAR TIME

	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
1977																		*1977*
1 MAR 60	!	!S	! T	!	!	!	! FEEE I	!	!	!	!	!	IT	! S	!	2 MAR 61
2 MAR 61	!	!S	! T	!	!	!	!EEEEE I	!	!	!	!	!	T!	! S	!	3 MAR 62
3 MAR 62	!	!S	! T	!	!	!	!EEEEE I	!	!	!	!	!	T!	! S	!	4 MAR 63
4 MAR 63	!	!S	! T	!	!	!	!EEEEE I	!	!	!	!	!	T!	! S	!	5 MAR 64
5 MAR 64	!	!S	! T	!	!	!	!EEEEE I	!	!	!	!	!	T!	! S	!	6 MAR 65
6 MAR 65	!	!S*****	!******	!******	!******	!******	!EEEEE*I	!******	!******	!******	!******	!******	!******	!*S	!	7 MAR 66
7 MAR 66	!	!S	! T	!	!	!	!EEEEE I	!	!	!	!	!	T!	! S	!	8 MAR 67
8 MAR 67	!	!S	! T	!	!	!	!EEEEEEI	!	!	!	!	!	T!	! S	!	9 MAR 68
9 MAR 68	!	!S	! T	!	!	!	E!EEEEEEI	!	!	!	!	!	T!	! S	!	10 MAR 69
10 MAR 69	!	!S	! T	!	!	!	E!EEEEEEI	!	!	!	!	!	T !	! S	!	11 MAR 70
11 MAR 70	!	!S	! T	!	!	!	E!EEEEEEI	!	!	!	!	!	T !	! S	!	12 MAR 71
12 MAR 71	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	!	T !	!S	!	13 MAR 72
13 MAR 72	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	!	T !	!S	!	14 MAR 73
14 MAR 73	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	!	T !	!S	!	15 MAR 74
15 MAR 74	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	!	T !	!S	!	16 MAR 75
16 MAR 75	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	!	T !	!S	!	17 MAR 76
17 MAR 76	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	!	T !	!S	!	18 MAR 77
18 MAR 77	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	T !	!	!S	!	19 MAR 78
19 MAR 78	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	T !	!	!S	!	20 MAR 79
20 MAR 79	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	T !	! S!		!	21 MAR 80
21 MAR 80	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	T !	! S!		!	22 MAR 81
22 MAR 81	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	T !	! S!		!	23 MAR 82
23 MAR 82	!	! S	! T	!	!	!	E!EEEEEEI	!	!	!	!	T !	! S!		!	24 MAR 83
24 MAR 83	!	! S	! T	!	!	!	E!EEEEE I	!	!	!	!	T !	! S!		!	25 MAR 84
25 MAR 84	!	! S	! T	!	!	!	E!EEEEE I	!	!	!	!	T !	! S!		!	26 MAR 85
26 MAR 85	!	! S	! T	!	!	!	E!EEEEE I	!	!	!	!	T !	! S!		!	27 MAR 86
27 MAR 86	!	! S	! T	!	!	!	E!EEEEE I	!	!	!	!	T !	! S !		!	28 MAR 87
28 MAR 87	!	! S	! T	!	!	!	E!EEEEE I	!	!	!	!	T !	! S !		!	29 MAR 88
29 MAR 88	!	! S	! T	!	!	!	E!EEEEE I	!	!	!	!	T !	! S !		!	30 MAR 89
30 MAR 89	!	! S	! T	!	!	!	E!EEEEE I	!	!	!	!	T !	! S !		!	31 MAR 90
31 MAR 90	!	! S	! T	!	!	!	E!EEEEE I	!	!	!	!	T !	! S !		!	1 APR 91
	! 0	! 1	! 2	! 3	! 4	! 5	! 6	! 7	! 8	! 9	! 10	! 11	! 12	! 13	! 14	! 15		

UNIVERSAL TIME

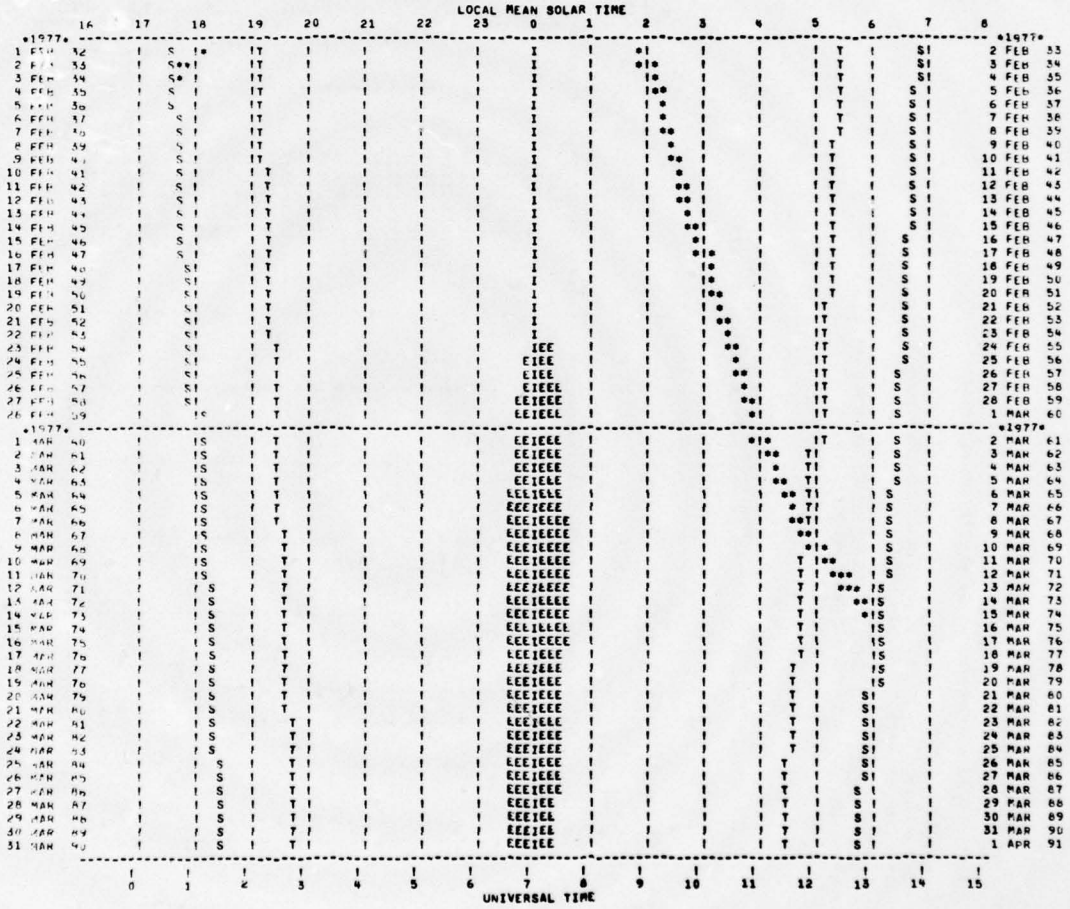
S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
A3567, USA SITE= STAL
DESTTA 74 033 A SYNCHRONOUS METEROLOGICAL SATELLITE - I (SDC 7298)

EPOCH= 1977 2 8:48:52.3
NE= 1.00269297 A= 6.6108 E= 0.0004127 I= 2.2362
ANODE= 129.6061 ARGPER= 92.0748 M= 267.9732

RHOA= 0.31 RAAX= 122.20 DECAX= -82.58 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 8.02 LONG FROM ANODE= 156.63

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH MAR 1977



S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

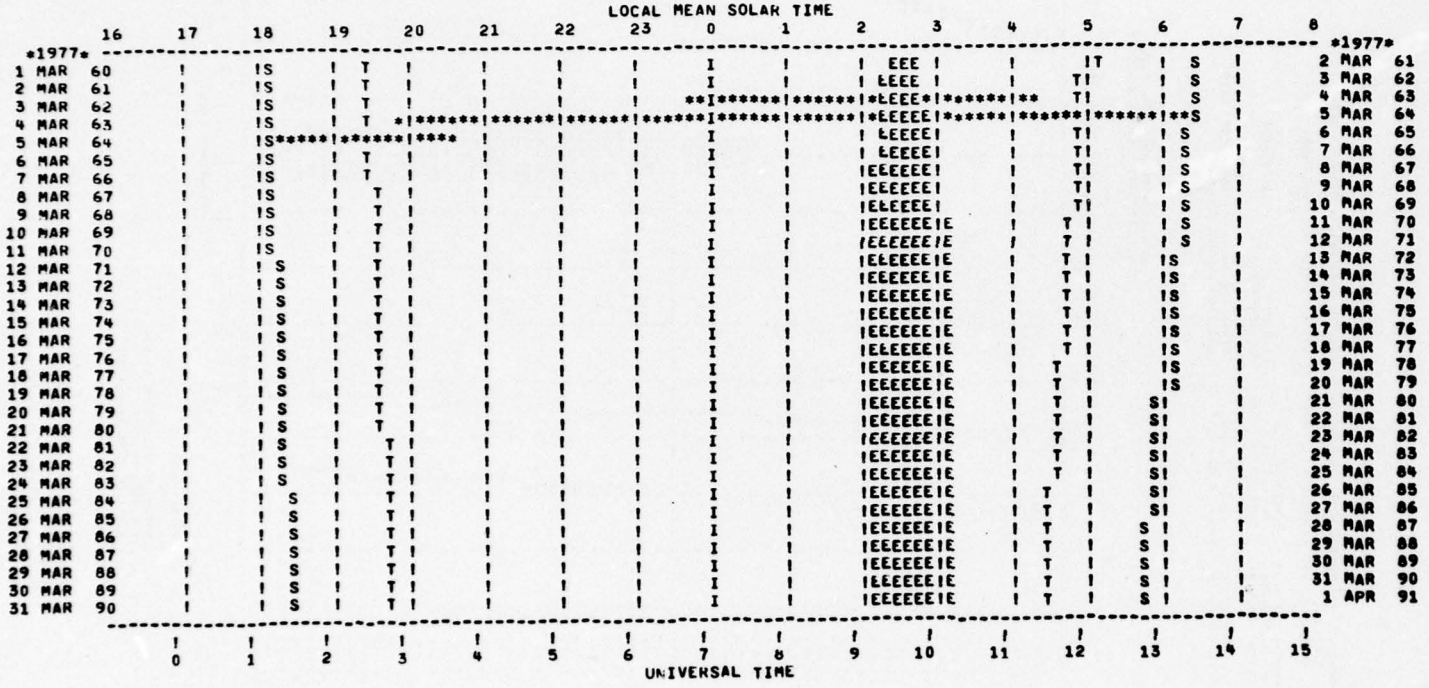
SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
83560. USA SITE= STAL
DESTA 75 011 A SYNCHRONOUS METEROLOGICAL SATELLITE II (SDC7648)

EPOCH= 1977 10 19:50:10.9
N= 1.0026578I A= 6.6110 E= 0.0465876 I= 0.2036
ANODE= 261.2774 ARGPER= 84.9134 M= 280.3859

RHO*A= 0.31 RAAX= 148.71 DECAX= -89.51 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.68 LONG FROM ANODE= 74.05

SATELLITE GRAPHIC TIME TABLE
FROM MAR 1977 THROUGH MAR 1977

LOCAL MEAN SOLAR TIME



S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
83505, USA SITE= STAL
DESTTA 75 100 A SMS-3 AXA GOESS-1 PAYLOAD (SDC 8366)

EPOCH= 1976 352 15:19: 5.9
N= 1.00270930 A= 6.6108 E= 0.0006129 I= 0.2868
ANODE= 241.5296 ARGPER= 45.5607 M= 314.4895

RHO*A= 0.31 RAAX= 6.96 DECAY= -89.82 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.17 LONG FROM ANODE= 52.38

SATELLITE GRAPHIC TIME TABLE
FROM MAR 1977 THROUGH MAR 1977

LOCAL MEAN SOLAR TIME

	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
1977																		*1977*
1 MAR	60		S	T			EE		I					T	S		2 MAR	61
2 MAR	61		S	T			EE		I					T	S		3 MAR	62
3 MAR	62		S	T			EE		I					T	S		4 MAR	63
4 MAR	63		S	T			EE		I					T	S		5 MAR	64
5 MAR	64		S	T			EE		I					T	S		6 MAR	65
6 MAR	65		S				EE		I					T	S		7 MAR	66
7 MAR	66		S	T			EE		I					T	S		8 MAR	67
8 MAR	67		S	T			EE		I					T	S		9 MAR	68
9 MAR	68		S	T			EE		I					T	S		10 MAR	69
10 MAR	69		S	T			EE		I					T	S		11 MAR	70
11 MAR	70		S	T			EE		I					T	S		12 MAR	71
12 MAR	71		S	T			EE		I					T	S		13 MAR	72
13 MAR	72		S	T			EE		I					T	S		14 MAR	73
14 MAR	73		S	T			EE		I					T	S		15 MAR	74
15 MAR	74		S	T			EE		I					T	S		16 MAR	75
16 MAR	75		S	T			EE		I					T	S		17 MAR	76
17 MAR	76		S	T			EE		I					T	S		18 MAR	77
18 MAR	77		S	T			EE		I					T	S		19 MAR	78
19 MAR	78		S	T			EE		I					T	S		20 MAR	79
20 MAR	79		S	T			EE		I					T	S		21 MAR	80
21 MAR	80		S	T			EE		I					T	S		22 MAR	81
22 MAR	81		S	T			EE		I					T	S		23 MAR	82
23 MAR	82		S	T			EE		I					T	S		24 MAR	83
24 MAR	83		S	T			EE		I					T	S		25 MAR	84
25 MAR	84		S	T			EE		I					T	S		26 MAR	85
26 MAR	85		S	T			EE		I					T	S		27 MAR	86
27 MAR	86		S	T			EE		I					T	S		28 MAR	87
28 MAR	87		S	T			EE		I					T	S		29 MAR	88
29 MAR	88		S	T			EE		I					T	S		30 MAR	89
30 MAR	89		S	T			EE		I					T	S		31 MAR	90
31 MAR	90		S	T			EE		I					T	S		1 APR	91

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

UNIVERSAL TIME

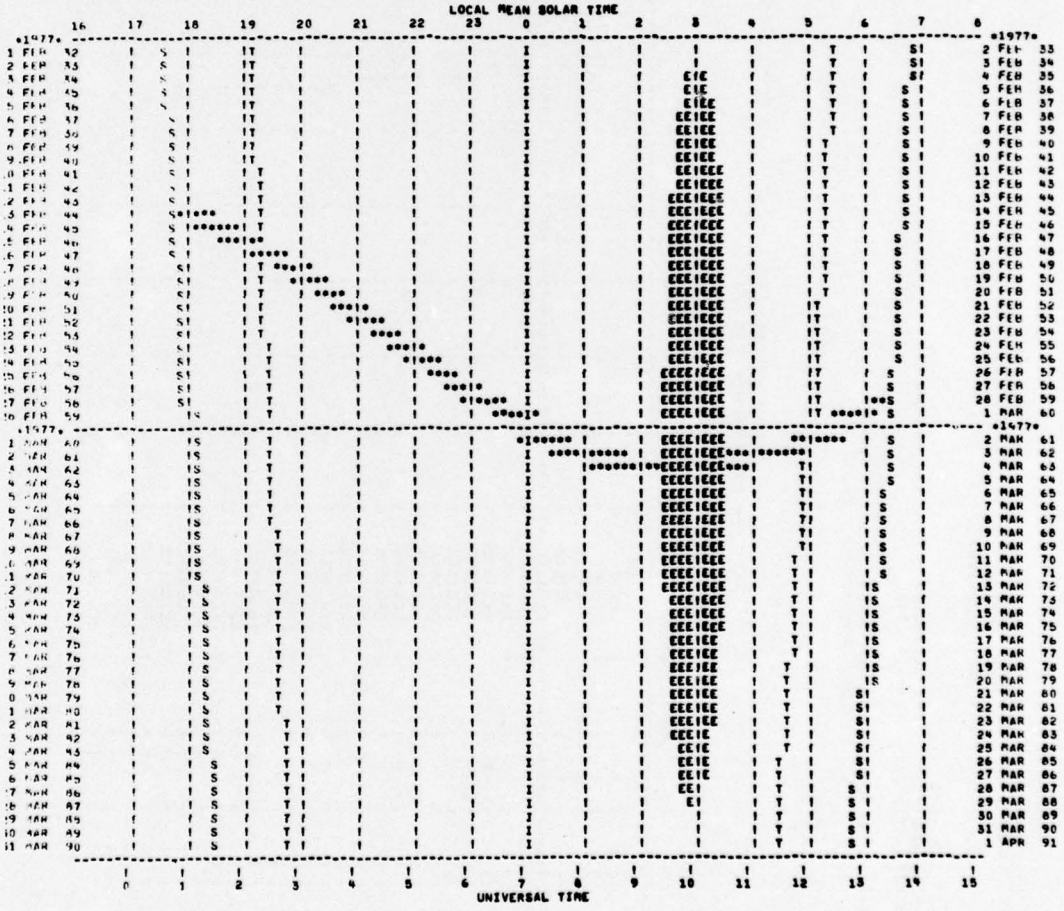
S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
43535. USA SITE= STAL
DESTTA 66 110 A APPLICATIONS TECHNOLOGY SATELLITE - 1 (SOC 2608)

EPOCH= 1976 294 11130124.6
M= 1.00271270 A= 6.6108 E= 0.0009180 I= 7.7898
ANODE= 52.8277 ARGPER= 170.1461 M= 189.8705

INCL= 0.14 MAX= 125.20 DECAX= -84.40 MISALGNAX= 0.00
OFFSET FROM ORB NORMAL= 2.94 LONG FROM ANODE= 125.21

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH MAR 1977



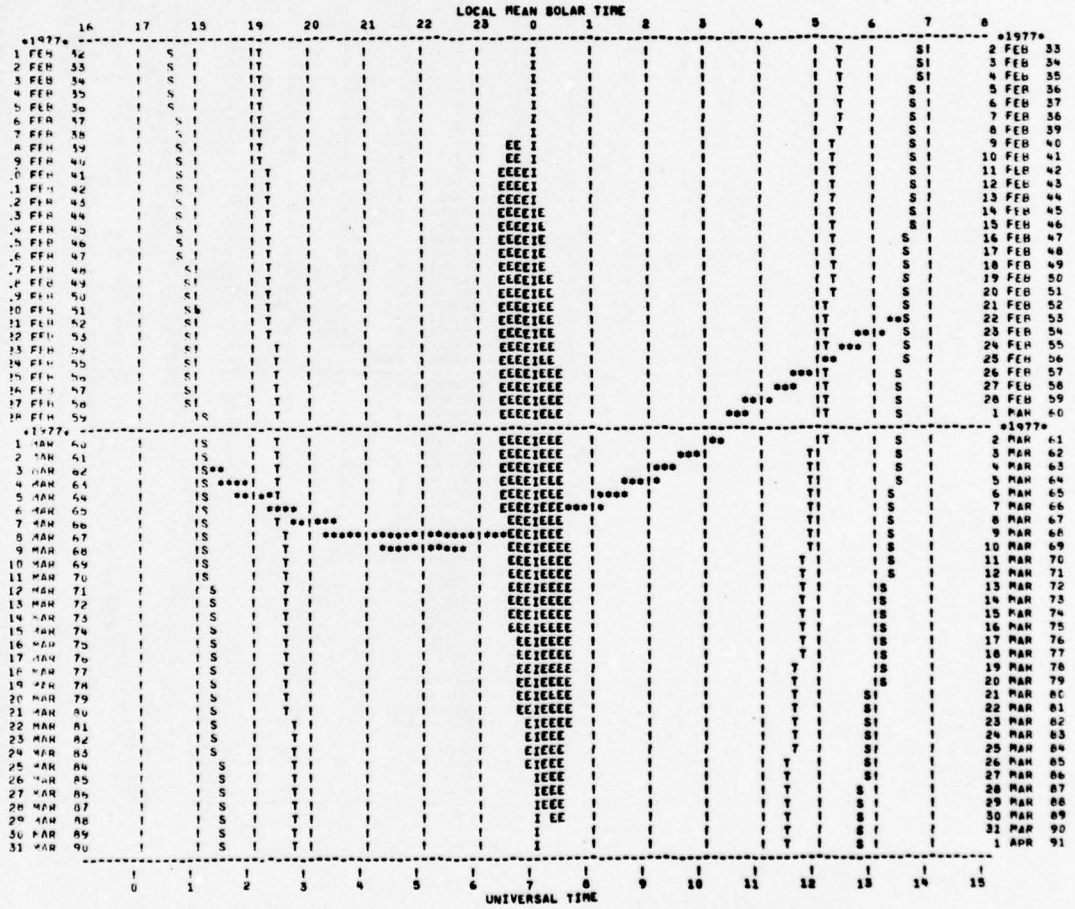
S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
43533, USA SITE= STAL
DESTA 67 111 A APPLICATIONS TECHNOLOGY SATELLITE - 3 (SDC 3029)

EPOCH= 1977 12 21:27:30.5
I= 1.00205567 A= 6.6136 E= 0.0017101 I= 6.8301
ANODE= 57.0656 ARGPER= 64.3280 M= 295.6602

DRAG= 0.14 MAAX= 154.30 DECAX= -86.90 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 3.28 LONG FROM ANODE= 83.16

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH MAR 1977



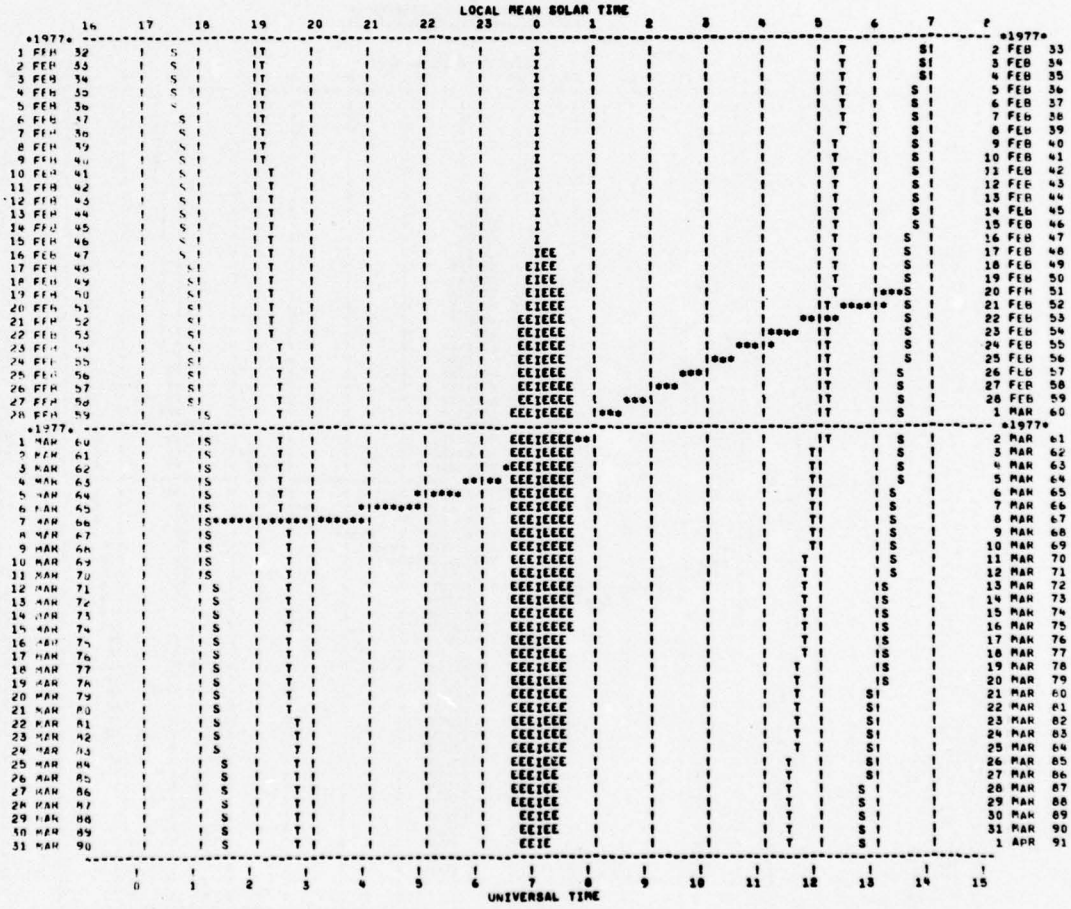
S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
#=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
AS523, USA SITE= STAL
DESTA 69 069 A APPLICATIONS TECHNOLOGY SATELLITE - 5 (SOC 4068)

EPOCH= 1976 345 6113141.5
N= 1.00272675 A= 6.6107 E= 0.0013508 I= 8.6766
ANODE= 66.9449 ARGPER= 177.7979 M= 182.2092

RHOMAX= 0.18 RMAX= 28.20 DECAX= 66.20 MISALGNAX= 0.00
OFFSET FROM ORB NORMAL= 3.23 LONG FROM ANODE= 23.61

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH MAR 1977



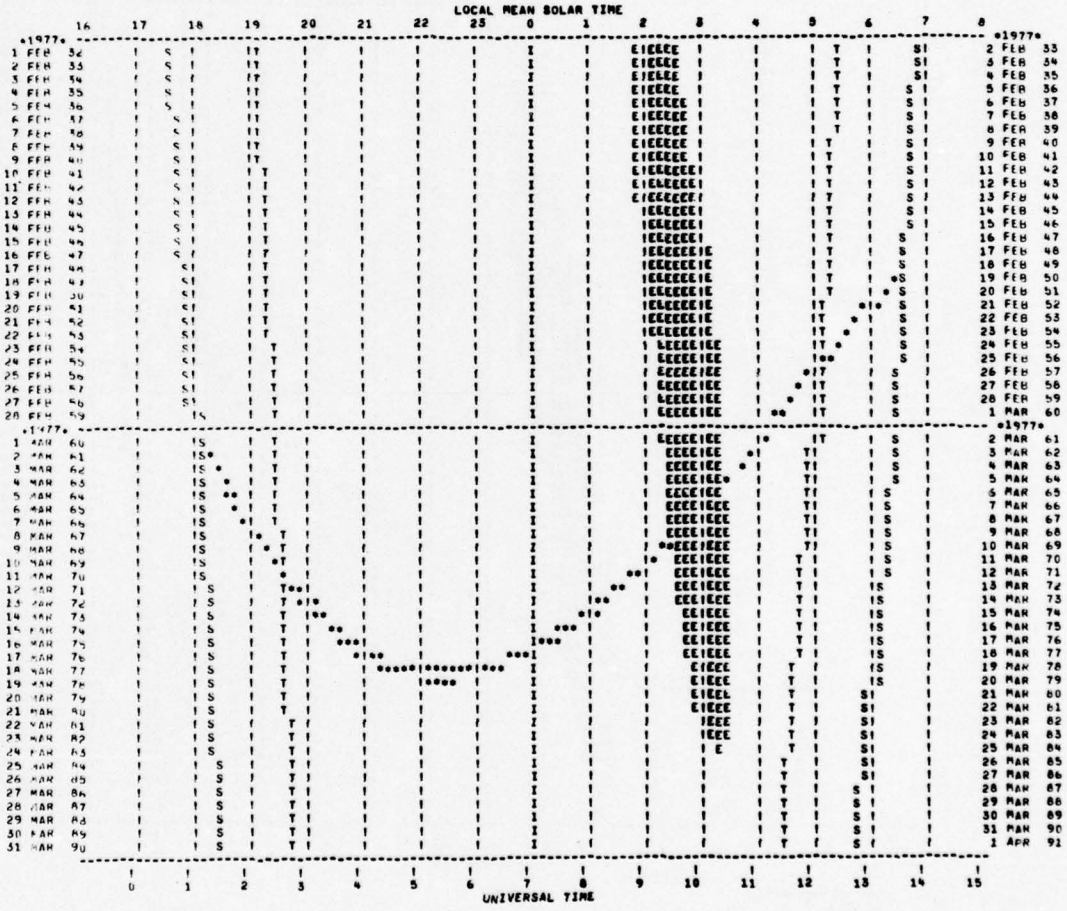
S=SUNSET/SUNRISE
T=TWILIGHT
•=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
A3512. USA SITE= STAL
DESTTA 65 028 A INTELSAT I-EB EARLY BIRD (SDC 1317)

EPOCH= 1976 344 01 01 0.0
N= 1.00179139 A= 6.6148 E= 0.0003107 I= 10.1056
ANODE= 46.2015 ARGPER= 138.2428 M= 135.0802

MMOTAT= 0.03 MAAX= 190.21 DECAX= -84.96 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 8.29 LONG FROM ANODE= 60.58

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH MAR 1977



S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
x=ALTITUDE LESS THAN 0 DEG

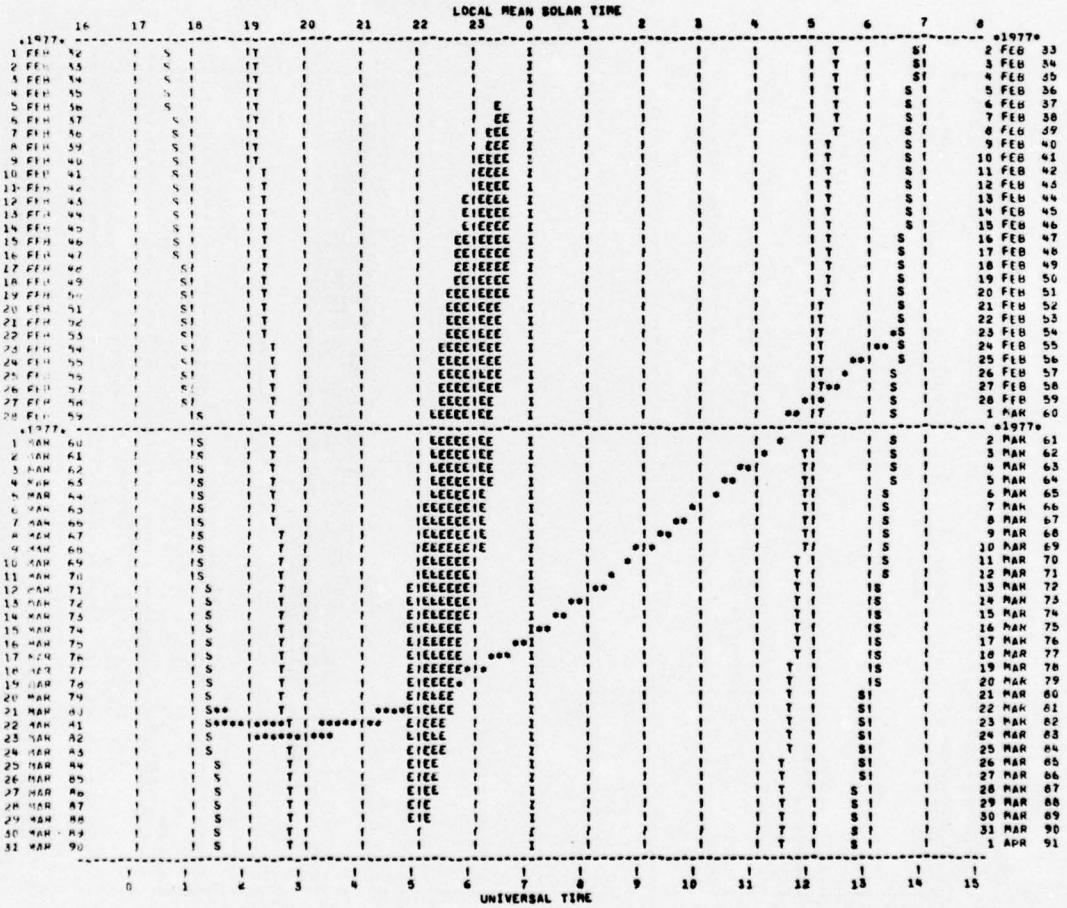
SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
93507. USA SITE= STAL
DESITA 67 026 A INTELSAT II F - 3 (SDC 2717)

EPOCH= 1976 344 01 01 0.0
N= 1.00381526 A= 6.6059 E= 0.0010574 I= 7.0909
ANODE= 51.8873 ARGPER= 295.5469 M= 331.6946

ANOMAX= 0.07 MAAX= 103.27 DECAX= -88.54 MISALGNAX= 0.00
OFFSET FROM ORB NORMAL= 5.97 LONG FROM ANODE= 98.79

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH MAR 1977

LOCAL MEAN SOLAR TIME



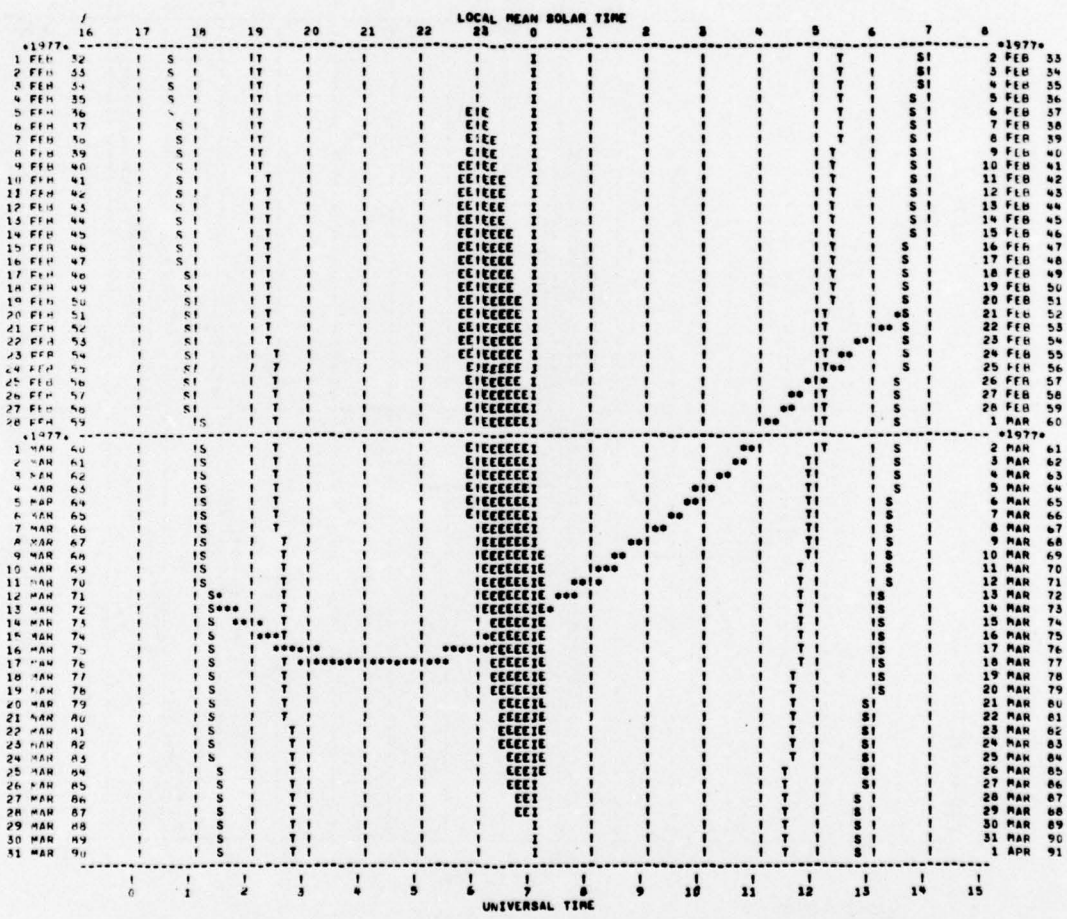
S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE: SPIN AXIS = SYMMETRY AXIS
83530, USA SITE: STAL
DESTTA 67 094 A INTELSAT II F - 4 (SOC 2969)

EPOCH= 1976 329 01 01 0.0
N= 1.00189957 A= 6.6143 E= 0.0002850 I= 7.1009
ANODE= 55.2918 ARGPER= 147.7616 M= 153.6489

RHO=A= 0.07 HAAX= 154.27 DECAX= -88.15 HISALONAX= 0.00
OFFSET FROM ORB NORML= 5.28 LONG FROM ANODE= 86.86

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH MAR 1977



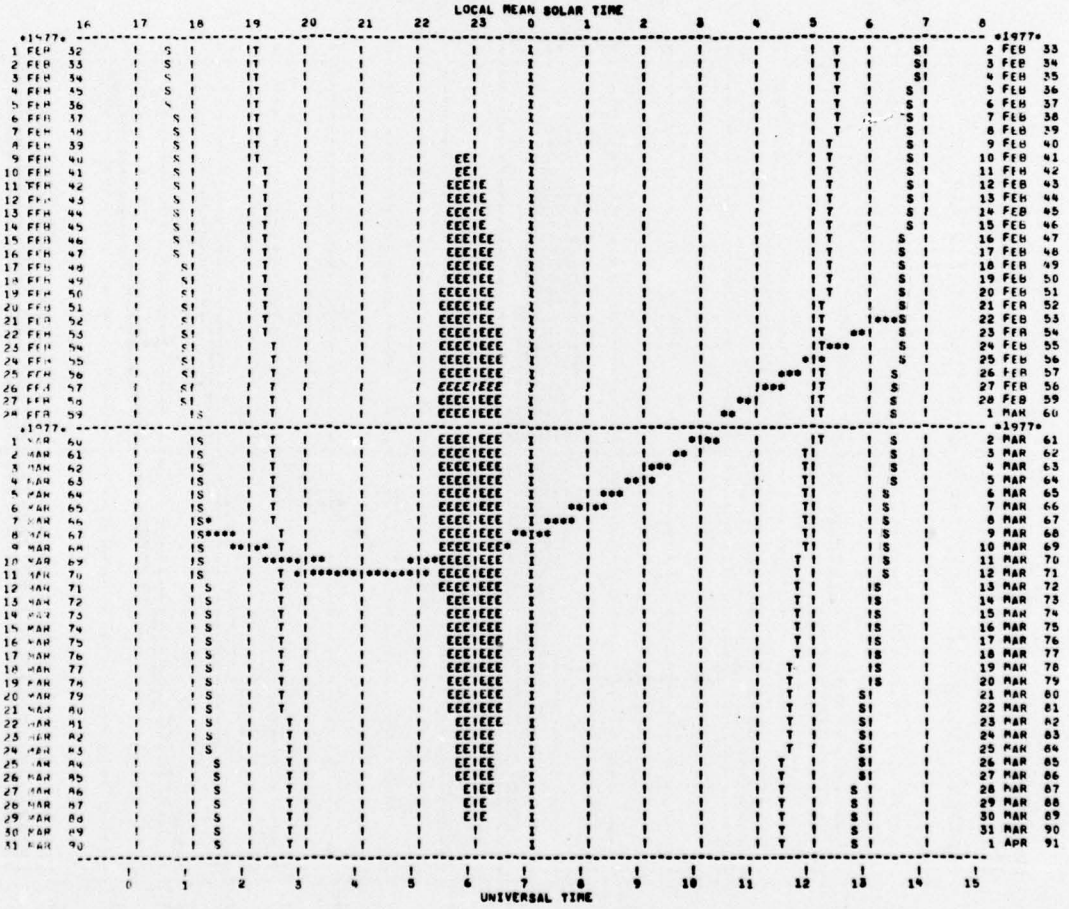
S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
x=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE. SPIN AXIS = SYMMETRY AXIS
 99513, USA SITE= STAL
 OFSITA 68 116 A INTELSAT III F-2 PAYLOAD (SDC 3628)

EPOCH= 1976 317 5145140.5
N= 1.00241086 AR 6.6121 E= 0.0007079 I= 6.0388
ANODE= 61.7218 ARGPER= 119.8603 M= 240.2128

RHOMAX 0.10 RAAX= 162.86 DECAX= -87.54 HISALONAX= 0.00
OFFSET FROM ORB NORML= 3.66 LONG FROM ANODE= 82.53

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH MAR 1977



S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
83534. USA SITE= STAL
DESITA 78 003 A INTELSAT III F - 6 (SDC 4297)

EPOCH= 1976 344 01 01 0.0
N= 1.00238484 A= 6.6122 E= 0.0013929 I= 4.8706
ANODE= 61.9031 ARGPER= 41.8313 M= 175.2242

RHO=A= 0.10 MAAX= 161.04 DECAX= -86.50 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 1.52 LONG FROM ANODE= 68.56

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH MAR 1977

LOCAL MEAN SOLAR TIME

	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
1977																		*1977*
1 FEB	32	S	T	T					I					T		S		2 FEB 33
2 FEB	33	S	T	T					I					T		S		3 FEB 34
3 FEB	34	S	T	T					I					T		S		4 FEB 35
4 FEB	35	S	T	T					I					T		S		5 FEB 36
5 FEB	36	S	T	T					I					T		S		6 FEB 37
6 FEB	37	S	T	T					I					T		S		7 FEB 38
7 FEB	38	S	T	T					I					T		S		8 FEB 39
8 FEB	39	S	T	T					I					T		S		9 FEB 40
9 FEB	40	S	T	T					I					T		S		10 FEB 41
10 FEB	41	S	T	T					I					T		S		11 FEB 42
11 FEB	42	S	T	T					I					T		S		12 FEB 43
12 FEB	43	S	T	T					I				EE	T		S		13 FEB 44
13 FEB	44	S	T	T					I				EEE	T		S		14 FEB 45
14 FEB	45	S	T	T					I				EEE	T		S		15 FEB 46
15 FEB	46	S	T	T					I				EEE	T		S		16 FEB 47
16 FEB	47	S	T	T					I				EEEEE	T		S		17 FEB 48
17 FEB	48	S	T	T					I				EEEEE	T		S		18 FEB 49
18 FEB	49	S	T	T					I				EEEEE	T		S		19 FEB 50
19 FEB	50	S	T	T					I				EEEEE	T		S		20 FEB 51
20 FEB	51	S	T	T					I				EEEEE	T		S		21 FEB 52
21 FEB	52	S	T	T					I				EEEEE	T		S		22 FEB 53
22 FEB	53	S	T	T					I				EEEEEE	T		S		23 FEB 54
23 FEB	54	S	T	T					I				EEEEEE	T		S		24 FEB 55
24 FEB	55	S	T	T					I				EEEEEE	T		S		25 FEB 56
25 FEB	56	S	T	T					I				EEEEEE	T		S		26 FEB 57
26 FEB	57	S	T	T					I				EEEEEE	T		S		27 FEB 58
27 FEB	58	S	T	T					I				EEEEEE	T	T	S		28 FEB 59
28 FEB	59	S	T	T					I				EEEEEE	T	S	S		1 MAR 60
1977																		*1977*
1 MAR	60	S	T	T					I				EE	E	S	S		2 MAR 61
2 MAR	61	S	T	T					I				EE	E	S	S		3 MAR 62
3 MAR	62	S	T	T					I				EE	E	S	S		4 MAR 63
4 MAR	63	S	T	T					I				EE	E	S	S		5 MAR 64
5 MAR	64	S	T	T					I				EE	E	S	S		6 MAR 65
6 MAR	65	S	T	T					I				EE	E	S	S		7 MAR 66
7 MAR	66	S	T	T					I				EE	E	S	S		8 MAR 67
8 MAR	67	S	T	T					I				EE	E	S	S		9 MAR 68
9 MAR	68	S	T	T					I				EE	E	S	S		10 MAR 69
10 MAR	69	S	T	T					I				EE	E	S	S		11 MAR 70
11 MAR	70	S	T	T					I				EE	E	S	S		12 MAR 71
12 MAR	71	S	T	T					I				EE	E	S	S		13 MAR 72
13 MAR	72	S	T	T					I				EE	E	S	S		14 MAR 73
14 MAR	73	S	T	T					I				EE	E	S	S		15 MAR 74
15 MAR	74	S	T	T					I				EE	E	S	S		16 MAR 75
16 MAR	75	S	T	T					I				EE	E	S	S		17 MAR 76
17 MAR	76	S	T	T					I				EE	E	S	S		18 MAR 77
18 MAR	77	S	T	T					I				EE	E	S	S		19 MAR 78
19 MAR	78	S	T	T					I				EE	E	S	S		20 MAR 79
20 MAR	79	S	T	T					I				EE	E	S	S		21 MAR 80
21 MAR	80	S	T	T					I				EE	E	S	S		22 MAR 81
22 MAR	81	S	T	T					I				EE	E	S	S		23 MAR 82
23 MAR	82	S	T	T					I				EE	E	S	S		24 MAR 83
24 MAR	83	S	T	T					I				EE	E	S	S		25 MAR 84
25 MAR	84	S	T	T					I				EE	E	S	S		26 MAR 85
26 MAR	85	S	T	T					I				EE	E	S	S		27 MAR 86
27 MAR	86	S	T	T					I				EE	E	S	S		28 MAR 87
28 MAR	87	S	T	T					I				E	E	S	S		29 MAR 88
29 MAR	88	S	T	T					I				E	E	S	S		30 MAR 89
30 MAR	89	S	T	T					I				E	E	S	S		31 MAR 90
31 MAR	90	S	T	T					I				E	E	S	S		1 APR 91

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

UNIVERSAL TIME

S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

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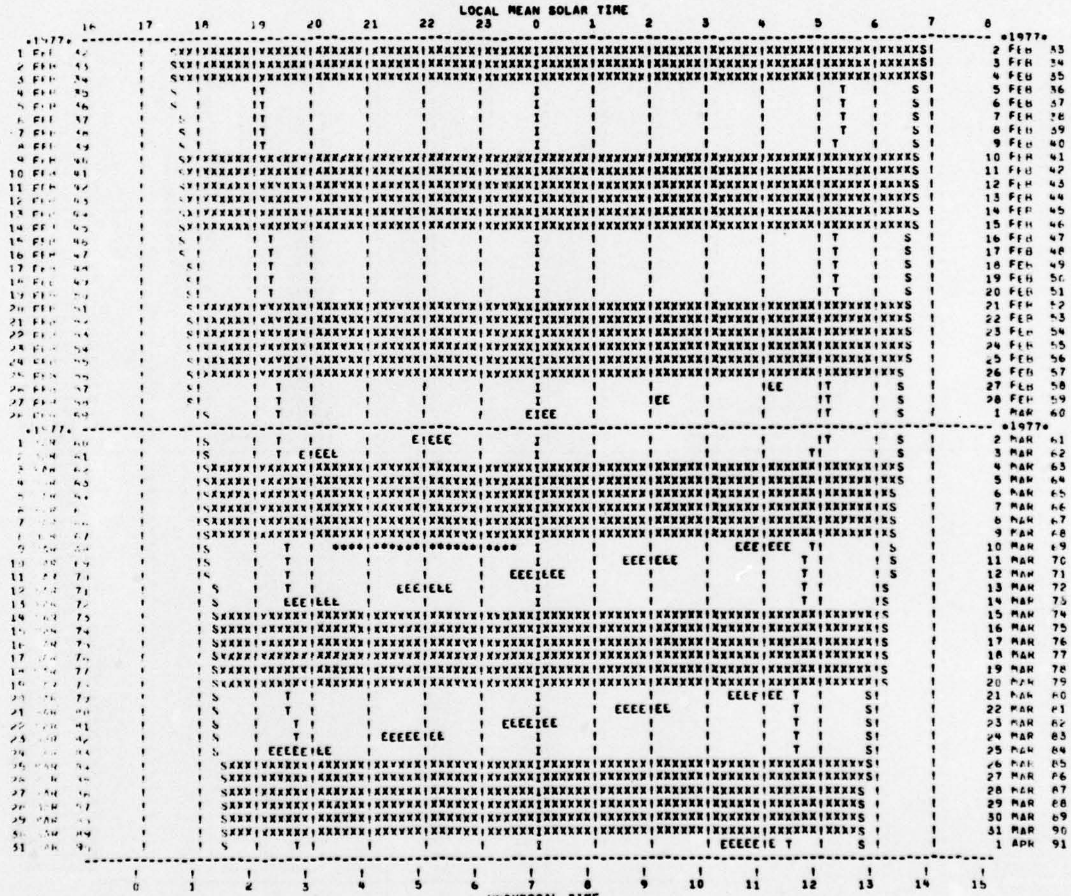
SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
   2866            USA                          SITE= STAL
  OESTTA  67 066 F  LINCOLN EXPERIMENTAL SATELLITE-5 (SDC 2866)

EPOCH= 1977   3     01 01 0.0
N=  1.09413858      A=  6.2372          E= 0.0048382        I=  2.9169
ANODE= 127.8991     ARGPER= 250.7868    M=  51.5704

RHO*A= 1.00         RAAX=  237.90       DECAX=  87.08       MISALGNAX=  0.00
OFFSET FROM ORB NORML=  0.00            LONG FROM ANODE=    0.00
```

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH MAR 1977



S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
83551, USA SITE= SIAL
67 003 A IDCSP 8 (SOC 2645)

EPOCH= 1974 81 16:17:33.6
N= 1.0831829 A= 6.2791 E= 0.0008864 I= 6.1751
ANODE= 60.4435 AMGPER= 141.5672 M= 57.1588

RHO*A= 1.00 MAAX= 330.44 DECAX= 85.82 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.00 LONG FROM ANODE= 0.00

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH FEB 1977

LOCAL MEAN SOLAR TIME

	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
1977																		*1977*
1 FEB	32	! S !	!T	!	!	!	!	!	I	!	!	!	!	! T !	!	S!	2 FEB	33
2 FEB	33	! S !	!T	!	! XX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXXXS!	3 FEB	34
3 FEB	34	! SXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXXXS!	4 FEB	35
4 FEB	35	! SXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXXS !	5 FEB	36
5 FEB	36	! SXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXXS !	6 FEB	37
6 FEB	37	! SX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXXS !	7 FEB	38
7 FEB	38	! SX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXXS !	8 FEB	39
8 FEB	39	! SX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXXS !	9 FEB	40
9 FEB	40	! SX	!XXXXXX	!XXXX !	!	!	!	!	I	!	!	!	! EEE	! T !	!	S !	10 FEB	41
10 FEB	41	! S !	! T !	!	!	!	!	!	I	!	!	! EEE	!	! T !	!	S !	11 FEB	42
11 FEB	42	! S !	! T !	!	!	!	!	!	I	EE!EE	!	!	!	**!******	!	S !	12 FEB	43
12 FEB	43	! S !	! T !	!	!	!	! E	!EEE	I	!	!	!	!******	!******	!*T !	*S !	13 FEB	44
13 FEB	44	! S !	! T !	!	!EEEEE !	!	!	!	I	!	! *	!******	!******	!******	!** !	S !	14 FEB	45
14 FEB	45	! S !	! TEEEE !	!	!	!	!	!	I	!	!	XXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXXS !	15 FEB	46
15 FEB	46	! SX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXS !	16 FEB	47
16 FEB	47	! SX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXS !	17 FEB	48
17 FEB	48	! SX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXS !	18 FEB	49
18 FEB	49	! SX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXS !	19 FEB	50
19 FEB	50	! SX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXS !	20 FEB	51
20 FEB	51	! SX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXXS !	21 FEB	52
21 FEB	52	! SX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!X	!	!**** !	!	E!EEEEE !	S !	22 FEB	53
22 FEB	53	! S	!***** ! T	!	!	!	!	!	I	***!**	!	!EEEEEE !	!	!T	!	S !	23 FEB	54
23 FEB	54	! S	!******	!**** !	! *	!******	!**** !	!	I	! EEEEE	!EE !	!	!	!T	!	S !	24 FEB	55
24 FEB	55	! S	! T !	!	!	!	!	!	EEE	!EEE !	!	!	!	!T	!	S !	25 FEB	56
25 FEB	56	! S	! T !	!	!	EE	!EEEE !	!	I	!	!	!	!	!T	!	S !	26 FEB	57
26 FEB	57	! S	! T E	!EEEEE !	!	!	!	!	I	!	!	!	!	!T	!	S !	27 FEB	58
27 FEB	58	! S	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXS !	28 FEB	59
28 FEB	59	!	!SXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXI	XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	!XXXXXX	XXS !	1 MAR	60

	! 0	! 1	! 2	! 3	! 4	! 5	! 6	! 7	! 8	! 9	! 10	! 11	! 12	! 13	! 14	! 15

UNIVERSAL TIME

S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
A3550, USA SITE= STAL
DESTTA 67 003 C IDCSP 10 (SEC 2650)

EPOCH= 1977 1 0: 0: 0.0
N= 1.00218792 A= 6.2830 E= 0.0029845 I= 7.8918
ANODE= 45.9669 ARGPER= 94.7935 M= 239.3822

RHO*A= 1.00 RAAX= 315.97 DECAX= 82.11 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.00 LONG FROM ANODE= 0.00

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH FEB 1977

LOCAL MEAN SOLAR TIME

	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
1977																		*1977*
1 FEB	32	!	SXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXS!	2 FEB 33
2 FEB	33	!	SXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXS!	3 FEB 34
3 FEB	34	!	SXX!	XXXXXX!	XXXXXX!	XXXXX !	!	!	!	I	!	!	!	!	EEE!	T	!	S!	4 FEB 35
4 FEB	35	!	S !	!	T	!	!	!	!	I	!	!	EE!	E	!	!	T	!	S !	5 FEB 36
5 FEB	36	!	S !	!	T	!	!	!	!	I	!	E!EEE	!	!	!	!	T	!	S !	6 FEB 37
6 FEB	37	!	S !	!	T	!	!	!	!EEEE	I	!	!	!	!	!	!	T	!	S !	7 FEB 38
7 FEB	38	!	S !	!	T	!	!	EEEE!	!	I	!	!	!	!	!	!	T	!	S !	8 FEB 39
8 FEB	39	!	S !	!	T	EEE!E	!	!	!	I	!	!	!	!	XX!	XXXXXX!	XXXXX!	XXXXS !	9 FEB 40
9 FEB	40	!	SX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXS !	10 FEB 41
10 FEB	41	!	SX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXS !	11 FEB 42
11 FEB	42	!	SX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXS !	12 FEB 43
12 FEB	43	!	SX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXS !	13 FEB 44
13 FEB	44	!	SX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXS !	14 FEB 45
14 FEB	45	!	SX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXS !	15 FEB 46
15 FEB	46	!	SX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	X**	!	EEEEE!	E	S !	16 FEB 47
16 FEB	47	!	S !	*!	******	******	******	!	!	*****	I	******	******	!*	!	EEE!	EE	! T ! S !	17 FEB 48
17 FEB	48	!	S!	! T	!	!	!	!	!	I	!	!	EE!	EEE	!	!	! T ! S !	18 FEB 49
18 FEB	49	!	S!	! T	!	!	!	!	E!	EEEEE	!	!	!	!	!	!	! T ! S !	19 FEB 50
19 FEB	50	!	S!	! T	!	!	!	EEEEE!	E	I	!	!	!	!	!	!	! T ! S !	20 FEB 51
20 FEB	51	!	S!	! T	!	EEEE!	EE	!	!	I	!	!	!	!	!	!T	! S !	21 FEB 52
21 FEB	52	!	S!	EEE!	EEEE	!	!	!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXS !	22 FEB 53
22 FEB	53	!	S!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXS !	23 FEB 54
23 FEB	54	!	S!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXS !	24 FEB 55
24 FEB	55	!	S!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXS !	25 FEB 56
25 FEB	56	!	S!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXS !	26 FEB 57
26 FEB	57	!	S!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXS !	27 FEB 58
27 FEB	58	!	S!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	XXS !	28 FEB 59
28 FEB	59	!	S!	XXXXX!	XXXXXX!	XXXXXX!	XXXXXX!	!	!	I	!	!	!	!	EEEE!	EEE	! S !	1 MAR 60

	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		

UNIVERSAL TIME

S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE. SPIN AXIS = SYMMETRY AXIS
83549. USA SITE= STAL
DESTTA 77 003 C IDCSP 11 (SDC 2651)

EPOCH= 1975 300 3:32: 2.0
N= 1.0a101634 A= 6.2875 E= 0.0035769 I= 7.1250
ANODE= 51.5831 ARGPER= 71.0101 M= 217.3293

RHO*A= 1.00 RAAX= 0.00 DECAX= 0.00 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 84.42 LONG FROM ANODE= 308.63

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH FEB 1977

LOCAL MEAN SOLAR TIME

	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
1977																		*1977*
1 FEB	32	!	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	!	2 FEB 33
2 FEB	33	!	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	!	3 FEB 34
3 FEB	34	!	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	!	4 FEB 35
4 FEB	35	!	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	!	5 FEB 36
5 FEB	36	!	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	!	6 FEB 37
6 FEB	37	!	SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	!	7 FEB 38
7 FEB	38	!	S	T					I				EEE	T		S	!	8 FEB 39
8 FEB	39	!	S	T					I		EEEE			T		S	!	9 FEB 40
9 FEB	40	!	S	* T					I	EEEE				T		S	!	10 FEB 41
10 FEB	41	!	S	T				EE	IEE	I				T		S	!	11 FEB 42
11 FEB	42	!	S	T		E	IEEEE			I				T		S	!	12 FEB 43
12 FEB	43	!	S	EEEE						I		XXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	!	13 FEB 44
13 FEB	44	!	SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	!	14 FEB 45
14 FEB	45	!	SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS	!	15 FEB 46
15 FEB	46	!	SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS	!	16 FEB 47
16 FEB	47	!	SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS	!	17 FEB 48
17 FEB	48	!	S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS	!	18 FEB 49
18 FEB	49	!	S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS	!	19 FEB 50
19 FEB	50	!	S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	X		EEEEEE	S	!	20 FEB 51
20 FEB	51	!	S	! T	! *	!	!	!	I	!	!	EEEE	IEE	! T	!	S	!	21 FEB 52
21 FEB	52	!	S	* T	!	!	!	!	I	!	EEE	IEEE	!	! T	!	S	!	22 FEB 53
22 FEB	53	!	S	T	!	!	!	!	EIEEEEE	!	!	!	!	! T	!	S	!	23 FEB 54
23 FEB	54	!	S	! T	!	!	IEEEEEEE	IE	I	!	!	!	!	! T	!	S	!	24 FEB 55
24 FEB	55	!	S	! T	!	EEEE	IEE	!	I	!	!	!	!	! T	!	S	!	25 FEB 56
25 FEB	56	!	S	EEE	IEEEE	!	!	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXS	!	26 FEB 57
26 FEB	57	!	S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXS	!	27 FEB 58
27 FEB	58	!	S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXS	!	28 FEB 59
28 FEB	59	!	SXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXS	!	1 MAR 60
		!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	

UNIVERSAL TIME

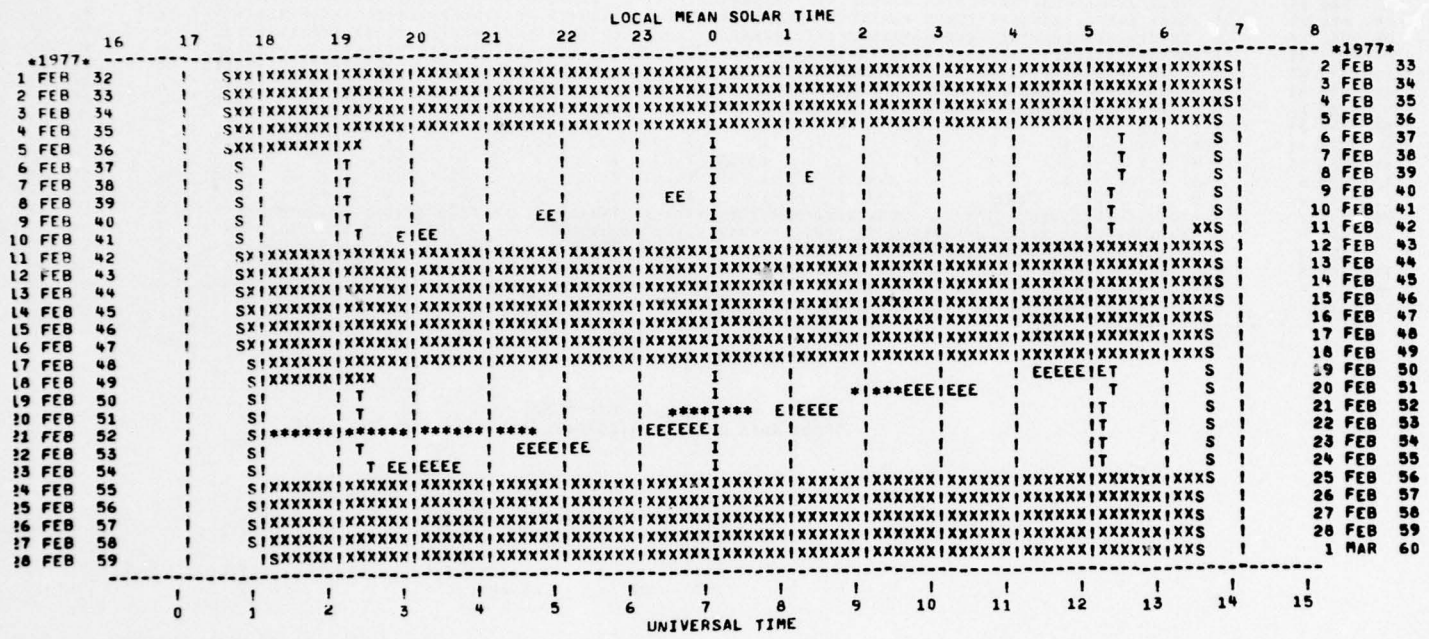
S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
33548. USA SITE= STAL
OESITA 67 003 E IDCSP 12 (SPC 2652)

EPOCH= 1975 25 0: 0: 0.0
N= 1.07945719 A= 6.2936 E= 0.0051698 I= 5.9630
ANODE= 54.6107 ARGPER= 182.3763 M= 48.2211

RHO*A= 1.00 MAAX= 324.61 DECAX= 84.04 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.00 LONG FROM ANODE= 0.00

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH FEB 1977



S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

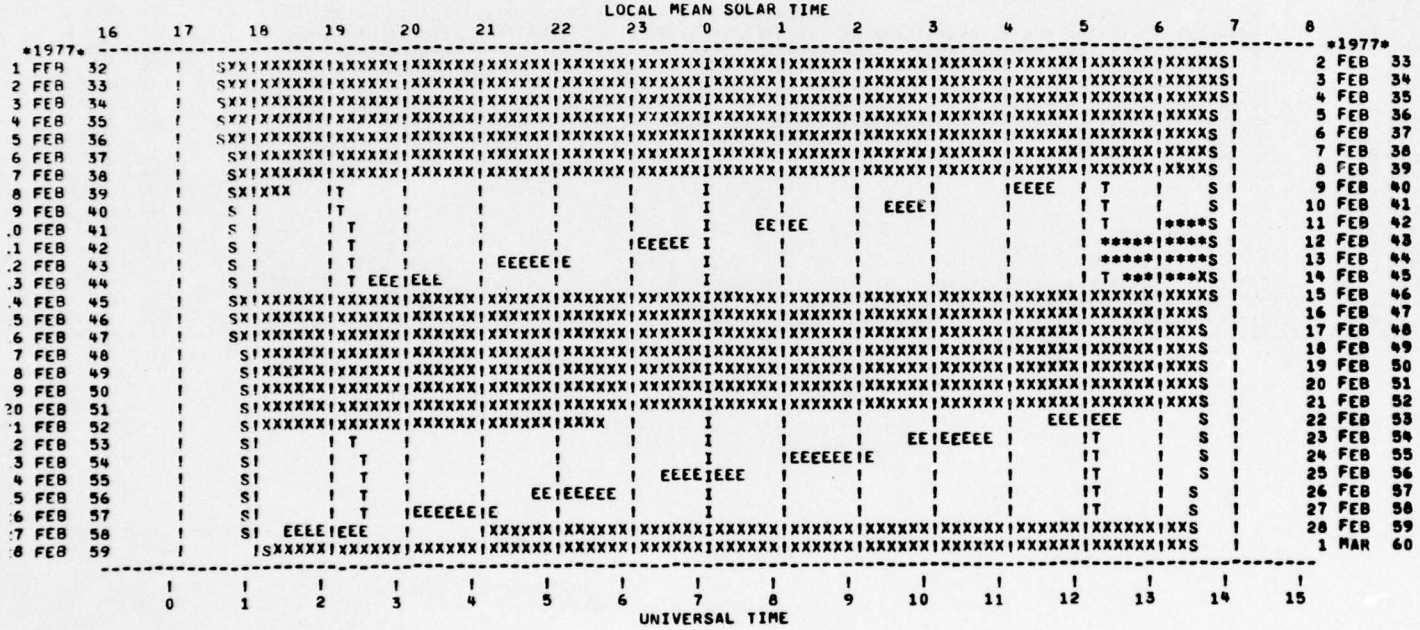
SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
8547. USA SITE= STAL
DESITA 67 003 F IDCSP 13 (SSC 2653)

EPOCH= 1976 290 5:24:22.9
N= 1.07745777 A= 6.3014 E= 0.0076861 I= 7.7132
NODE= 47.3058 ARGPER= 32.3941 M= 328.0781

RHO*A= 1.00 MAAX= 317.31 DECAX= 82.29 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.00 LONG FROM ANODE= 0.00

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH FEB 1977

LOCAL MEAN SOLAR TIME



S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
23546. USA SITE= SIAL
DESITA 67 003 G IOCSP 14 (SEC 2654)

EPOCH= 1976 294 9: 9:13.4
I= 1.07510419 A= 4.3106 E= 0.0057556 I= 7.6760
ANODE= 47.1327 ARGPER= 25.5366 M= 334.7492

(H0*A= 1.00 RAAX= 317.13 DECAX= 82.32 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.00 LONG FROM ANODE= 0.00

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH FEB 1977

LOCAL MEAN SOLAR TIME

	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
1977																		*1977*
1 FEB	32		SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	2 FEB 33
2 FEB	33		SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	3 FEB 34
3 FEB	34		SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	4 FEB 35
4 FEB	35		SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXX	I				EIEET		S		5 FEB 36
5 FEB	36		S	T					I			EEEE		T		S		6 FEB 37
6 FEB	37		S	T					I		EEEIE			T		S		7 FEB 38
7 FEB	38		S	T					EIEEE					T		S		8 FEB 39
8 FEB	39		S	T				EEEE	I					T		S		9 FEB 40
9 FEB	40		S	T		EEIEE			I					T		S		10 FEB 41
10 FEB	41		S	EEEEE					I		x	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS		11 FEB 42
11 FEB	42		SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS		12 FEB 43
13 FEB	43		SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS		13 FEB 44
14 FEB	44		SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS		14 FEB 45
15 FEB	45		SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS		15 FEB 46
16 FEB	46		SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS		16 FEB 47
17 FEB	47		SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS		17 FEB 48
18 FEB	48		S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS		18 FEB 49
19 FEB	49		S	XXXXXX	XXXXXX	XXXXXX	X*****	******	******	******	*			EEEE	EE	S		19 FEB 50
20 FEB	50		S	T					I			EE	EEEE	T		S		20 FEB 51
21 FEB	51		S	T					I		EEEEEE			T		S		21 FEB 52
22 FEB	52		S	T					EEEEIEEE					T		S		22 FEB 53
23 FEB	53		S	T			EE	EEEEE	I					T		S		23 FEB 54
24 FEB	54		S	T		EEEEEIE			I					T		S		24 FEB 55
25 FEB	56		S	EEE	EEEE				XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS		25 FEB 56
26 FEB	57		S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXS		26 FEB 57
27 FEB	58		S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXS		27 FEB 58
28 FEB	59			SXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXS		1 MAR 60

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

UNIVERSAL TIME

S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
 13544. USA SITE= STAL
 DESTIN 67 066 A IOCSP 16 (SOC 2862)

EPOCH= 1976 275 0: 0: 0.0
N= 1.03955460 A= 6.2167 E= 0.0065452 I= 0.2349
NODE= 86.5782 ARGPER= 236.6675 M= 81.4320

RHO*A= 1.00 RAAX= 356.58 DECAX= 89.77 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.00 LONG FROM ANODE= 0.00

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH FEB 1977

LOCAL MEAN SOLAR TIME

	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
1977																		*1977*
1 FEB	32	!	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	2 FEB 33
2 FEB	33	!	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	3 FEB 34
3 FEB	34	!	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	4 FEB 35
4 FEB	35	!	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	!	5 FEB 36
5 FEB	36	!	S	!	!T	!	!	!	!	I	!	!	!	!	!	T	! S	! 6 FEB 37
6 FEB	37	!	S	!	!T	!	!	!	!	I	!	!	!	!	!	T	! S	! 7 FEB 38
7 FEB	38	!	S	!	!T	!	!	!	!	I	!	!	!	!	!	T	! S	! 8 FEB 39
8 FEB	39	!	S	!	!T	!	!	!	!	I	!	!	!	!	!	T	! S	! 9 FEB 40
9 FEB	40	!	S	!	!T	!	!	!	!	I	!	!	!	XXXXX	XXXXXX	XXXXXX	XXXXS	! 10 FEB 41
10 FEB	41	!	SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	! 11 FEB 42
11 FEB	42	!	SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	! 12 FEB 43
12 FEB	43	!	SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	! 13 FEB 44
13 FEB	44	!	SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	! 14 FEB 45
14 FEB	45	!	SX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	! 15 FEB 46
15 FEB	46	!	SX	XXXXXX	XXXXXX	XXXXXX	XXXX	!	!	I	!	!	!	!	!	T	! S	! 16 FEB 47
16 FEB	47	!	S	!	! T	!	!	!	!	I	!	!	!	!	!	T	! S	! 17 FEB 48
17 FEB	48	!	S	!	! T	!	!	!	!	I	!	!	!	!	!	T	! S	! 18 FEB 49
18 FEB	49	!	S	!	! T	!	!	!	!	I	!	!	!	!	!	T	! S	! 19 FEB 50
19 FEB	50	!	S	!	! T	!	!	!	!	I	!	!	!	!	!	T	! S	! 20 FEB 51
20 FEB	51	!	S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS	! 21 FEB 52
21 FEB	52	!	S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS	! 22 FEB 53
22 FEB	53	!	S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS	! 23 FEB 54
23 FEB	54	!	S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS	! 24 FEB 55
24 FEB	55	!	S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXS	! 25 FEB 56
25 FEB	56	!	S	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXX	! S	!	26 FEB 57
26 FEB	57	!	S	!	! T	!	!	!	!	I	!	!	!	EEE	!	!T	! S	! 27 FEB 58
27 FEB	58	!	S	!	! T	!	!	!	!	I	!	!EEE	!	!	!	!T	! S	! 28 FEB 59
28 FEB	59	!	!S	!	! T	!	!	!	E	EEE	I	!	!	!	!	!T	! S	! 1 MAR 60
		!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	

UNIVERSAL TIME

S=SUNSET/SUNRISE
T=TWILIGHT
*=SPECULAR REFLECTION AT SITE
E=ECLIPSED BY EARTH
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
93541. USA SITE= STAL
DESTTA 68 050 D IDCSP 23 (SOC 3287)

EPOCH= 1976 352 15:26:58.0
N= 1.01460593 A= 6.5590 E= 0.0008390 I= 0.2643
ANODE= 271.1139 ARGPER= 174.9760 M= 185.0324

RHO*A= 1.00 RAAX= 181.11 DECAX= 89.74 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.00 LONG FROM ANODE= 0.00

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH FEB 1977

LOCAL MEAN SOLAR TIME

	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
1977																		*1977*
1 FEB 32		S	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	2 FEB 33
2 FEB 33		S	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	3 FEB 34
3 FEB 34		S	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXS	4 FEB 35
4 FEB 35		S	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	5 FEB 36
5 FEB 36		S	SXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXS	6 FEB 37
6 FEB 37		S	SX	XXXXXX	XXXXXX	XXXX			I					T	T	S		7 FEB 38
7 FEB 38		S	S	T					I					T	T	S		8 FEB 39
8 FEB 39		S	S	T					I					T	T	S		9 FEB 40
9 FEB 40		S	S	T					I					T	T	S		10 FEB 41
10 FEB 41		S	S	T					I					T	T	S		11 FEB 42
11 FEB 42		S	S	T					I					T	T	S		12 FEB 43
12 FEB 43		S	S	T					I					T	T	S		13 FEB 44
13 FEB 44		S	S	T					I					T	T	S		14 FEB 45
14 FEB 45		S	S	T					I					T	T	S		15 FEB 46
15 FEB 46		S	S	T					I					T	T	S		16 FEB 47
16 FEB 47		S	S	T					I					T	T	S		17 FEB 48
17 FEB 48		S	S	T					I					T	T	S		18 FEB 49
18 FEB 49		S	S	T					I					T	T	S		19 FEB 50
19 FEB 50		S	S	T					I					T	T	S		20 FEB 51
20 FEB 51		S	S	T					I					T	T	S		21 FEB 52
21 FEB 52		S	S	T					I					T	T	S		22 FEB 53
22 FEB 53		S	S	T					I					T	T	S		23 FEB 54
23 FEB 54		S	S	T					I					T	T	S		24 FEB 55
24 FEB 55		S	S	T					I					T	T	S		25 FEB 56
25 FEB 56		S	S	T					I					T	T	S		26 FEB 57
26 FEB 57		S	S	T				E	I					T	T	S		27 FEB 58
27 FEB 58		S	S	T				EE	I					T	T	S		28 FEB 59
28 FEB 59		S	S	T				EEE	I					T	T	S		1 MAR 60

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

UNIVERSAL TIME

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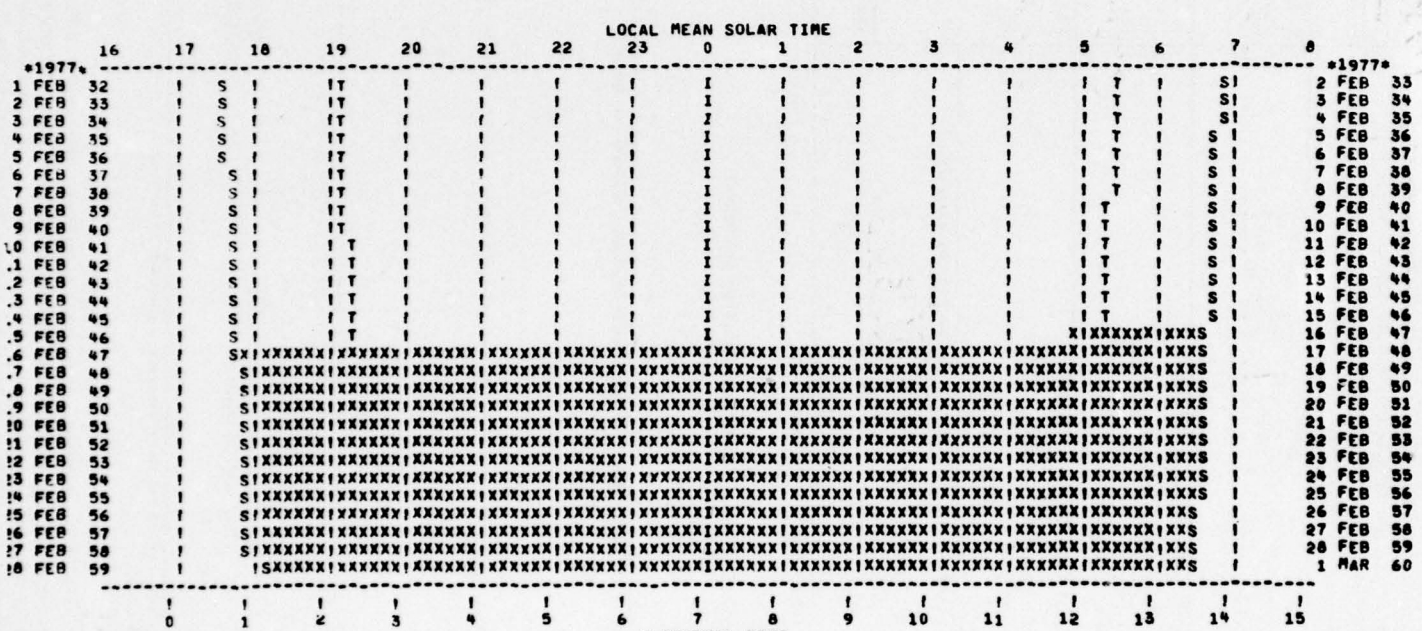
X=ALTITUDE LESS THAN 0 DEG

SPECULAR REFLECTION FROM CYLINDRICAL SATELLITE, SPIN AXIS = SYMMETRY AXIS
83506. USA SITE= STAL
DESTTA 68 050 E IDCSP 24 (SOC 328A)

EPOCH= 1976 344 0: 0: 0.0
E= 0.99070380 A= 6.6641 E= 0.0091757 I= 2.4326
ANODE= 276.3816 ARGPER= 70.3699 M= 205.6774

RHO*A= 1.00 RAAX= 186.38 DECAx= 87.57 MISALGNAX= 0.00
OFFSET FROM ORB NORML= 0.00 LONG FROM ANODE= 0.00

SATELLITE GRAPHIC TIME TABLE
FROM FEB 1977 THROUGH FEB 1977



S=SUNSET/SUNRISE
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specular reflection timing
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satellite observation
artificial satellites

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

With the approach of the vernal equinox, preparations for observing specular reflections from cylindrical synchronous satellites have begun. The purpose of this report is to assemble the results of preliminary computations to make them available for observation scheduling at the GEODSS Experimental Test Site.

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